



IN COOPERATION WITH COLORADO STATE UNIVERSITY  
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## Carnation Disbudding Studies

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Disbudding of carnations is a necessary practice. Labor costs make it expensive and it is often done wrong. The two studies reported here are intended to be the first of a series looking into aspects of this phase of carnation handling.

### I. Disbudding Effect on Flower Development

The effects of disbudding on rate of flower development were investigated by establishing three arbitrary sizes of terminal buds at the time lateral buds were removed.

The center or terminal bud was less than 1 cm in diameter for the early stage of disbudding. The normal stage included terminal buds from 1 to 1½ cm in diameter and the late stage included stems with terminal buds larger than 1½ cm. Stems were disbudded and tagged according to these stages from February 22 to April 28, 1972. The time from disbudding to flowering was recorded for each flower. Average time periods between disbudding and flowering are grouped by stages of disbudding and disbud dates in Table 1.

Looking at the results of each stage, almost the same time was required for flowers to develop after dis-

budding in all three months. Development was more variable in April; however, as expected flowers that were disbudded at later stages developed in a shorter time.

Table 1. Time between disbudding and flowering for White Sim carnation disbudded at 3 stages.

Stage	Disbud date	Average days to flowering
<b>Early</b> 180 flowers	February	27-30
	March	28-30
	April	26-28
<b>Normal</b> 180 flowers	February	20-24
	March	20-24
	April	19-25
<b>Late</b> 175 flowers	February	14-17
	March	13-16
	April	14-21

### II. Disbudding Effects on Flower Size

The heads were weighed from tagged flowers in Test I to determine effect of stage of disbudding on flower size. A sample of 100 flowers was not disbudded; these flowers were also weighed at the time of bloom.

<sup>1</sup>Kenneth Patterson completed this work while a Colorado Flower Growers Association undergraduate research assistant at CSU.

Table 2. Effect of stage of disbudding on flower size of White Sim carnation.

Disbudding stage	No. flowers	Ave. wt. flowers grams
Early	93	8.5
Normal	96	7.9
Late	73	8.0
Not disbudded	100	6.3

These data indicate that for maximum size carnations should be disbudded as early as possible and practical. There was no real difference between the normal and late stages indicating that these two classes may not be distinct. Those flowers not disbudded were seriously reduced in size. This shows the serious loss a grower can experience if disbudding is done on the grading table.

### III. Side Effects of Early Disbudding

Spur growth was most evident on those flowers that were disbudded early. The spurs were not usually longer than  $\frac{1}{4}$  inch. A bending of the stem, usually at the second node from the top, away from the point where the disbud was removed was observed on a few flowers. This can be due to an injury such as removal of or injury to the leaf subtending the disbud at that node. Possibly even squeezing the node could cause this bending.

The proper stage of disbudding is probably that stage of development requiring the least labor. A flower stem should not be disbudded until all reproductive buds can be removed at one time. The center bud should be looked at first. If the top bud can be raked off with a flip of the finger the stem should be cleared of reproductive shoots. If this top bud cannot be removed easily, the stem should be skipped until the next disbudding period. Handling a flower stem twice to remove disbuds increases labor unnecessarily.

Very few signs of crippling or spur growth were observed when carnation stems were disbudded at the "normal" or "late" stages. While there was some loss in flower size by delaying disbudding to these stages, there was probably no more than a two-day delay in flowering by disbudding at the "late" stage compared to disbudding early. A more complex experiment would be required to determine this.

Other experiments planned in this series are:

1. A comparison of the "pull" method with the normal "break off" method in all aspects including labor required, injury, spur growth, and optimum stage of bud growth.
2. A comparison of labor required for disbudding at early and late stages.
3. The effects of light, temperature, daylength, and stem vigor on number of disbuds produced.